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Owned and published by the *Central African Journal of Medicine* in conjuction with the Faculty of Medicine

University of Zimbabwe

STRAND MULTIPRINT (PVT) LTD

The acceptability of insecticide treated mosquito nets among community members in Zimbabwe

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Abstract

Objectives: To assess the acceptability of insecticide treated mosquito nets (ITNs) among community members in Zimbabwe for the implementation of effective malaria intervention using ITNs.
Design: A cross sectional study and longitudinal study were carried out using questionnaires, which were administered by health workers from rural health centres.

Cent Afr J Med 2002;48(7/8):87-91

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Setting: Communities in rural areas from seven districts namely Bulilimamangwe, Chipinge, Gokwe, Hurungwe, Lupane, Mount Darwin and Uzumba Maramba Pfungwe (UMP) in Zimbabwe.
Subjects: 1 576 community members who bought ITNs in the project areas.
Main Outcome Measure: Acceptance of ITNs and price, reasons for wanting or not wanting nets; ITNs usage and washing pattern among respondents.
Results: More than 90% of people said they bought the nets from the project in order to avoid mosquito bites and to prevent malaria. Quite a number of respondents (69%) gave the answer that they bought mosquito nets from the project because they were cheaper (Z$130 to Z$390) than the market price (Z$1 000) and more than half (58.3%) claimed that they could not afford to buy mosquito nets at the market price. The price was accepted by the majority as cheap or very cheap in Gokwe, Hurungwe, Mount Darwin, and UMP (92%, 82%, 98% and 90%, respectively). Other responses given for having bought nets were at health staff's recommendation (71.3%), and they were suffering from malaria (40.9%). The reasons for not having bought mosquito nets were that they had not suffered from malaria (55.5%), that they did not like to use a mosquito net (31.1%), did not know the efficacy of the net (21.6%), or there were not many mosquitoes at home (28.9%). The percentage of ITN use was very high (90 to 100%) amongst those who bought nets. The percentage of children under five years and pregnant women who were ITN users ranged from six to 24% to 2.8 to 9.7%, respectively. Percentage of "others" which means those above five years and not pregnant was more than 70% in all the districts. The washing pattern of ITNs in Chipinge showed that most of the mosquito nets (74.5%) were washed every three to five months.
Conclusion: Acceptability of ITNs was very high based on reported utilisation of ITNs. It is recommended that rural communities should be sensitised on the importance of treated nets for malaria prevention, and advised to purchase mosquito nets whenever cash is readily available in each community.

Introduction

Insecticide treated mosquito nets (ITNs) have been shown to have a significant impact on malaria morbidity and mortality in recent worldwide trials. Several trials on the impact of ITNs on the morbidity and mortality of malaria have been conducted in Africa. Most of the studies documented show a reduction of 20 to 60% in malaria prevalence rates following introduction of ITN.[1] Measured impact on malaria morbidity reduction was 47%, 44.7%, and 44% in Gambia,[2] Tanzania[3] and Kenya,[4] respectively. Regarding the mortality, reductions of 17% in Ghana,[5] 33% in Kenya,[6] and 25% in The Gambia[6] were achieved in all-cause child mortality.

It is estimated that it costs 10 working days to treat a case of malaria in Africa and also malaria has been ranked first by the World Bank in terms of disability-adjusted life years (DALYs) lost in sub-Saharan Africa.[7]

Malaria remains a major public health problem in Zimbabwe. It is estimated that over five million people out of a population of 12 million people live in malaria infested areas and a significant number of both local and international travellers visit these areas throughout the year.

In year 2000, 12% of outpatient attendants and approximately 6% (45 284) of inpatient admissions to public health facilities were due to malaria. Over 1 430 000 clinical cases and 1 979 deaths from malaria were reported in 2000.[8]

The current malaria control strategy is multi-pronged including case management, residual house spraying, larviciding, and personal protection such as ITNs. The current strategic plan is a part of the health ministry's three year rolling plan (1999 to 2001)[9] and Roll Back Malaria Strategy for Zimbabwe (2001 to 2007)[10] in the context of the sector's 10 year National Health Strategy (1997 to 2007).[11] Personal prevention methods with mosquito nets have not been currently used in Zimbabwe to a large extent.[12] A national conference on the use of ITNs held in Kadoma, Zimbabwe, in July 1998 recommended that the Ministry of Health and Child Welfare (MOHCW) promote the use of ITNs. In this context, the Infectious Disease Control project in Zimbabwe has developed community based ITN projects to introduce mosquito nets to communities and to establish a distribution system and insecticide treatment.

The project was initiated in eight model districts, namely, Bulilimamangwe, Chipinge, Gokwe, Hurungwe, Lupane, Mount Darwin, Uzumba Maramba Pfungwe (UMP) and Mwenezi, since March 1999. The scheme is sales of nets at a subsidised price in priority areas with the worst malaria problems in each district, based on endemicity, socio-economic status, accessibility, and existing capacity to support implementation. The project committees such as village development committees (VIDCOs), farmers and wild life officers' committees were organised to support the project activities in the areas. Hence, the price of ITNs was decided by the committee in each area.

Materials and Methods

The study area comprised seven model districts; one district each from seven provinces except Masvingo Province. All these districts are considered as high risk malaria areas. The districts are predominantly agricultural areas although

there are some mining activities being undertaken. During sales of nets, those who bought nets were interviewed about ITNs using a questionnaire.

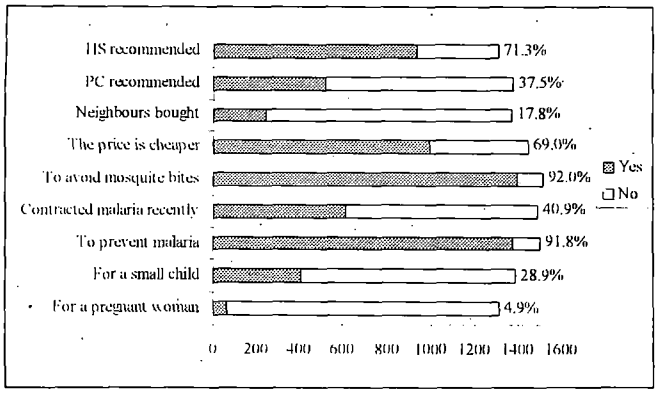
In carrying out the interviews information was collected on acceptability of nets, reasons for wanting or not wanting nets at the subsidised price and, what people thought about the price. The users were also followed up to observe net usage, washing and re-treatment in four districts, namely, Bulilimamangwe, Chipinge, Lupane, and Mount Darwin every month after purchase of ITNs from November 1999 to October 2000.

Results

Affordability of nets, reasons for wanting or not wanting nets.

Key informants were those who bought ITNs in the community based project areas. Of the 1 576 respondents, mean age was 35.9 years with 62.7% males and 37.3% females. The majority of respondents were subsistence farmers (60.4%) followed by teachers (25.3%). Other notable categories included civil servants (3.5%), health staff (2%), businessmen (2.5%), and councillors (0.5%). Civil servants included policemen, council employees and agriculture extension workers. The majority of respondents (69%) reported brick houses as their type of dwelling, followed by mud houses (26%) and other forms of dwelling (5%). Brick houses were significantly more common than mud houses among the respondents ($p<0.05$).

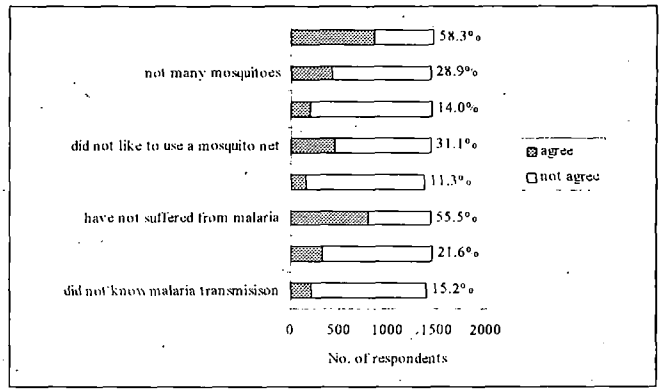
Figure I: Why do you buy mosquito nets?



HS: Health staff.
PC: Project committee.

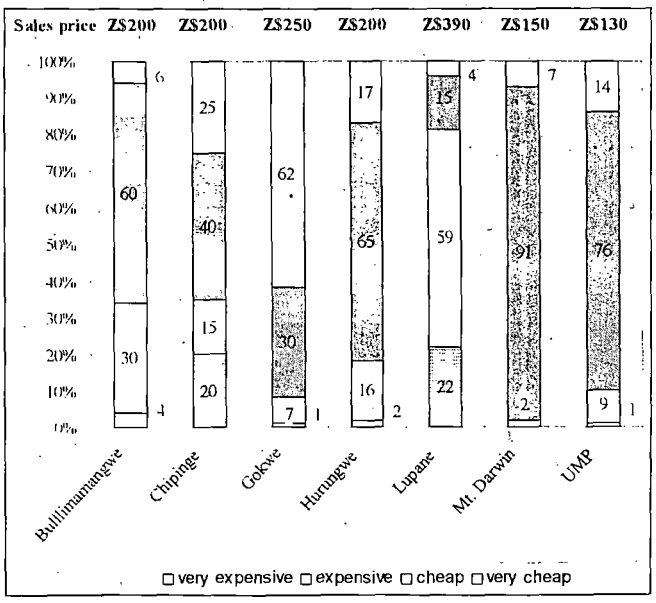
Figure I shows the reasons why the people bought mosquito nets from the project. More than 90% of respondents said they bought the nets from the project in order to avoid mosquito bites (92.0%) and to prevent malaria (91.8%). A number of respondents indicated that they bought mosquito nets because of the cheaper price (69%) and because of the health staff's recommendation (71.3%). Fewer people mentioned the project committee's recommendation (37.5%) and suffering from malaria (40.9%). Others bought the nets because their neighbours had done so (17.8%) and they wanted to protect a small child (28.9%) or pregnant women (4.9%). More than half (58.3%) of respondents indicated that they could not buy the nets before the project because the nets were too expensive for them and that they had not suffered from malaria (55.5%). Fewer respondents gave the answers that they did not like to use a mosquito net (31.1%), they did not know the efficacy of the net (21.6%) or there were not many mosquitoes at home (28.9%). A few respondents mentioned that they did not care about mosquito bites (14.0%), others thought sleeping under the net was hot (11.3%), while those who did not know about malaria transmission made up 15.2% of the respondents (Figure II).

Figure II: Reasons why the purchasers did not buy mosquito nets before.



The price of ITNs and what people thought about their price is shown in Figure III (US$ = Z$55). The price was accepted as cheap and very cheap in Bulilimamangwe (60%, 6% respectively), Gokwe (29%, 63%), Hurungwe (71%, 8%), Mount Darwin (92%, 1%), and UMP (76%, 14%). In Chipinge, more than half of respondents felt the mosquito net was expensive (19%) and very expensive (35%). In Lupane also, a large number of respondents (54%) felt the net was expensive and 24% felt it was very expensive.

Figure III: Acceptability of the price of ITNs.



Acceptability of ITNs, washing pattern and re-treatment.

Net use was determined from September 1999 to August 2000 in the four districts. All those who bought nets used them throughout the year in Mount Darwin and more than 95 % of respondents used them in Chipinge. In Lupane and Bulilimamangwe, more than 90% of ITNs were used except in July and August (82% to 87%). People were also asked who was using ITNs in the households. Percentages of ITN users are shown by group and by district (Table I).

Table I: Percentage of ITN users by district.

	Children under 5 years	Pregnant women	Others	Number of users followed for all groups
Bulilimamangwe	6.0%	6.0%	88.8%	12
Chipinge	24.0%	2.8%	73.2%	328
Lupane	15.7%	5.6%	78.7%	38
Mount Darwin	17.1%	9.7%	73.2%	141

The percentage of children under five years old as ITN users was highest in Chipinge (24%) followed by Mount Darwin (17.0%) and Lupane (15.7%), Bulilimamangwe was (6%) ($p<0.01$).

The percentages of pregnant women using nets in Mount Darwin, Bulilimamangwe, Lupane and Chipinge were 9.7%, 6%, 5.6%, and 2.8%, respectively. Percentage of "others" was more than 70% in all the districts. It should be noted that only a few users were followed up in Bulilimamangwe and Lupane.

The habit of washing and re-treatment of nets was ascertained from September 1999 to August 2000. One hundred users were followed up and none of them washed nets in Bulilimamangwe. All the users re-treated the nets from October 1999 to February 2000 and most of the re-treatment (72%) was conducted through a re-treatment campaign in November. In Mount Darwin, among 174 users followed up, none of them washed them and only16 users (9.2%) re-treated nets. Both districts offered re-treatment of nets free of charge. In Chipinge, among 142 ITNs followed through the year, three nets were washed three times, 105 twice and 33 only once in the year. Most of the nets (74.5%) were washed within three to five months. There was no particular time of the year when people tended to wash nets. No nets were re-treated in this period. This information was not available from Lupane.

Discussion

The majority of those who bought nets were farmers and teachers. Since the project sites were chosen mainly in communal farming areas, the majority of the study population was engaged in subsistence farming and civil services. The majority of respondents reported brick houses as their type of dwelling. Socio-economic determinants such as occupations and type of dwellings did affect the decision to buy nets. If people have a higher income and a higher standard of housing, people would have a better life style including using mosquito nets.

More than 90% of respondents said they bought the nets from the project in order to avoid mosquito bites and to prevent malaria. The response on avoiding mosquito bites has been reported in previous studies.[13,14] However, Chavasse *et al.* reported that protection against malaria is rarely a reason given for net use, which is different from the present study.

In this study, the response of preventing malaria might have been mentioned because of health education during the sales campaign. A number of respondents gave the answer that they bought nets because of the cheaper price and claimed that they could not afford to buy nets at the market price. This means that the price of nets determines people's decision to buy nets. The subsidised price was accepted by the majority as cheap or very cheap in Gokwe, Hurungwe, Mount Darwin, and UMP.

In Chipinge and Bulilimamangwe, more than half of the respondents felt the mosquito net was expensive or very expensive despite being the same price in Hurungwe. In Lupane, the price was highest and a large number of respondents felt it was expensive or very expensive. It is understandable that people felt the price cheap in Mount Darwin and UMP since the prices were 60 to 80% below the market rates. Gokwe residents are more likely to have better access to cash from cotton sales as compared to residents from other districts. This could be the reason the majority of respondents felt the price was very cheap although the price was higher than the other districts. People's feeling about the price also depends not only on the price but also their income and priority of requirement. Health-related requirements might be accorded low priority compared to other needs.

Other responses given for having bought nets were raised awareness about malaria such as health staff's and project committee's recommendations and the experience of suffering from malaria. On the other hand, the reasons for not having bought nets indicated low awareness about malaria, mosquitoes and effectiveness of nets.

In a previous study, knowledge of malaria transmission was high but knowledge of ITNs as a malaria preventive method was low in the same districts.[15] The result indicates the awareness campaign should be intensified to educate people on malaria and create ITN demand.

The percentage of ITN use was very high. More than 90% of respondents used them even in the dry season when there is a large reduction in mosquito numbers. This is good practice because malaria can still be transmitted and people are at risk during the dry season. Although the reason people consistently use nets was not determined, those who paid for nets must have well understood the importance of malaria prevention. Furthermore visits of interviewers every month might have stimulated users to continue to use the nets. Knowing who used nets is important in interventions when the number of nets are not sufficient for everybody in the household.

Acceptability of ITNs, washing pattern and re-treatment.

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The percentage of children under five and pregnant women as ITN users was much less than the percentage of "others" in all the districts. This situation is well understood not only because fathers are given priority for commodities which are in short supply but also because everybody is at risk in Zimbabwe where malaria transmission is mostly unstable in nature.

Net washing patterns are important for knowing how frequently nets must be re-treated. Most of the users washed nets every three to five months in Chipinge. Regarding re-treatment, only Bulilimamangwe district managed to re-treat all of the nets which they had sold. Most of the users treated nets in November, before the malaria season. In this study a marked difference was found in mosquito net re-treatment. High success in re-treatment was attributed to intensive promotion in Bulilimamangwe.

Knowledge about local attitudes to prevention of malaria, in particular, feelings about nets will help in the planning and implementation of large-scale projects and will ensure that the implementation is socially acceptable. Further study is needed to find out about ability, willingness to pay, seasonality of income if we are considering some or all of the costs from the community. Seasonality of income is more common in rural communities where people have cash after harvesting and selling cash crops like cotton. This may influence when people can afford to buy nets and pay for treatment. Finding out when cash is available in the community and how this relates to the malaria and mosquito seasons, can help to decide when to promote net sales and treatment considering the cost effectiveness of the campaign. It is recommended that rural communities should be sensitised on the importance of mosquito nets as tools against malaria, and advised to purchase nets when cash is available such as the harvest season in each community.

Acknowledgements

This study was performed as a part of the activities in the MOHCW and JICA Project on infectious disease control starting July 1996. The training of health workers for the implementation of the project and survey was held in each district from March to November, 1999 with assistance from the Blair Research Institute and Provincial Medical Director's offices. Appreciation goes to Dr Sikosana, MOHCW-JICA project provincial co-ordinators and model district co-ordinators. Our special gratitude to the health staff in the seven districts for their assistance, especially in the collection of data in the communities.

The authors are also indebted to Prof. K Moji of Nagasaki University for developing the questionnaire, Mr HT Masendu of Blair Research Institute, Prof. M Tsuji of Kyorin University Medical School and Dr H Tanaka, Prof. Emeritus, and for their review of the manuscript.

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